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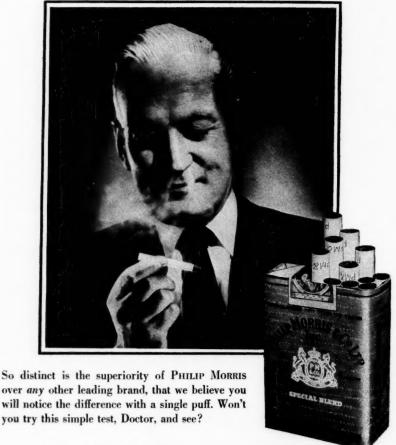
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#### TABLE OF CONTENTS

CTUDY OF PROLONGED LABOR As Applicated 120 Community	PA
STUDY OF PROLONGED LABOR, An Analysis of 120 Cases,  John B. McCann, M.D. and Paul P. Norman, M.D.	*******
CANCER CONFERENCE FOR PHYSICIANS, Abstracts from Lectures gi at Fifth Annual Cancer Conference	
AIR POLLUTION AND CANCER OF THE LUNG, W. C. Hueper, M.D.	
EDITORIALS .	
Report on the Health Needs of the Nation	
First In The Union	
A Doctor in the House	
The Interim Meeting	
DEPARTMENTS	
Report of Delegate to the AMA	
District Medical Society Meetings	
In Military Service	
Book Reviews	*******
R. I. Medical Society — Necrology, 1952	******
Component Societies by Medical Districts	******
MISCELLANEOUS	
Photograph: Drs. Louis H. Bauer, Albert H. Jackvony and Earl F. Kelly	
Correspondence — Cancer Detection Centers	
Pathologists Meeting	******
Providence Medical Association, February Program	

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# The RHODE ISLAND MEDICAL JOURNAL

VOL. XXXVI

JANUARY, 1953

NO. 1

#### STUDY OF PROLONGED LABOR\*

An analysis of one hundred twenty cases

Occurring in primigravidae

JOHN B. McCann, M.D., AND PAUL P. NORMAN, M.D.

The Authors. John B. McCann, M.D., Resident Physician, and Paul P. Norman, M.D., Assistant Resident Physician, Providence Lying-In Hospital.

PROLONGED LABOR is a condition which taxes the judgment of the most experienced obstetrician. According to Reid, Mengert, and many other authorities, this syndrome is usually restricted to primiparous patients, and occurs in five to ten per cent of all labors.

Most authorities agree that any true labor of over thirty hours duration is prolonged. Reid and others are of this opinion, while different observers have designated periods ranging from twelve to thirty-six hours as the time limit after which a labor is prolonged.

One of the major factors in the etiology of prolonged labor is disproportion between the presenting part and the maternal pelvis. Many cases of disproportion can be recognized before the onset or during early labor either clinically or radiographically. However, relative disproportion may exist which cannot be readily determined. There may be borderline contraction at the mid pelvis; also disproportion may be caused by occipito-posterior positions associated with a narrow forepelvis or associated with an anteriorly implanted placenta which diminishes the available conjugate or oblique diameters. Finally masses in the pelvis may give rise to dystocia.

Uterine inertia, either primary or secondary, may result in prolonged labor. Primary inertia occurs when the contractions are irregular in character and dilatation of the cervix is slow. This is usually due to poorly coordinated uterine contractions. As Reynolds and Karlson have each shown, there is a coordinated interaction between the contraction and retraction of the fundus and the relaxation of the relatively passive lower uterine seg-

ment, constituting a normal gradient of activity. Any failure of this mechanism will prevent proper dilatation of the cervix. Other factors in inertia are, medication, if given too early in labor and in too great amount, and hormonal imbalance.

Secondary inertia is described as a condition in which labor, having begun normally, ceases, with no apparent cause. However, maternal exhaustion, a fibrotic cervix, or mid-pelvic disproportion may be implicated.

No paper on prolonged labor can be complete without mentioning the so-called dystrophia-dystocia syndrome which is an expression of endocrine imbalance producing a short, squat, hirsute woman, usually with a small anthropoid or android pelvis, and a small infantile uterus. She may experience relative infertility and her cervix may be fibrotic, dilating with difficulty if at all. She is, therefore, a candidate for an obstructive labor.

In treatment, we must consider the effect of a long labor on the fetus, who suffers the increasing danger of asphyxia and intra-cranial hemorrhage, and also on the mother who may be exposed to hemorrhage, infection, and electrolyte imbalance. Recent advances in x-ray pelvimetry, antiobiotic and supportive therapy, and the refinement of the extra-peritoneal Caesarean section have greatly decreased the infant and maternal morbidity and mortality. Pituitary derivatives have aided in accelerating certain of these labors.

In this paper, cases of prolonged labor occurring in primigravidae, delivered at the Providence Lying-in Hospital are reviewed. These came from both the private and the clinic services. Obstetrics at this institution is conducted by an active staff of trained obstetricians and an associate staff of general practitioners who have had post-graduate training; and a resident staff. Eighty-three per cent of all cases delivered in this hospital were on the private service.

The purpose of this study was to analyze primiparous prolonged labors with respect to:

<sup>\*</sup>Presented at the Providence Lying-In Hospital Alumni Day, at Providence, R. I., October 10, 1951.

- 1. Age of mother
- 2. Length of pregnancy
- 3. Birth-weight of infants
- 4. Methods of delivery
- 5. Classification of pelves
- 6. Complications of delivery and
- 7. Fetal survival rates

#### Material

We have carefully analyzed the prolonged labors occurring in primigravidae during the two year period following June 1, 1949. During this period there were 13,655 total deliveries (excluding miscarriages) among which were 5,131 cases of primiparous labors, constituting 37.5% of all deliveries. All the cases diagnosed as prolonged labor, all Caesarean sections in primigravidae, and all primiparous abnormal labors, were evaluated. Many cases called prolonged labor were excluded from this series because they failed to satisfy our criteria for prolonged labor. A few cases not recorded as prolonged labor, were included, because critical evaluation revealed satisfactory evidence of prolonged labor. No cases of recognizable hydramnios, twins, or obstruction due to either tumor or presentational or developmental abnormality of the fetus qualified for inclusion.

As recommended by many authors we established 30 hours as the length of labor which would be considered prolonged. Our criteria for the time of onset of labor was either the time when the cervix was found to have changed with regard to effacement or dilatation, or the time when contractions of the uterus became regular, at intervals of at least 7 minutes-becoming steadily stronger and more sustained, and causing detectable cervical change as noted on subsequent rectal or vaginal examination. Strict evaluation of all primigravida labors revealed 120 cases of prolonged labor, occurring in 5,131 cases for an incidence of 2.3% which compares reasonably with the incidence as reported by various authors.

A curve representing the ages of these mothers was prepared. The mode and mean lie between the 24th and 25th years. A similar curve was prepared from the ages of 500 consecutive primiparae delivered in this hospital during the period of this study. The mode of this curve is 22 years and the mean lies between the 23rd and 24th years. The patients experiencing long labor were only slightly older

than those in the control group.

#### Length of Pregnancy

The relationship between long pregnancy and prolonged labor was investigated. A comparison of the estimated date of confinement with the delivery date in our series and in two other series was made. (Fig. 1.) A slightly greater incidence of prolonged pregnancy occurred in our cases than

Comparison of the length of Pregnancies

200 Cases Unselected	7000 Cases (Kortenoever)	Prolonged Labor
48%	51%	56%
27	24	13
12	13	14
8 .	8	10
4	5	6
99	101	99
	Unselected 48% 27 12 8 4	Unselected (Kortenoever) 48% 51% 27 24 12 13 8 8 4 5

in a control series of 200 consecutive primiparous labors, and in Kortenoever's series of 7000 cases. The curves are almost identical until 17 days after the estimated date of confinement, after which time, 16% of our cases delivered as contrasted with 12% and 13% respectively for the other series; while only 6% of our cases were delivered after the 23rd day in contrast to 4% and 5% respectively for the others.

#### Birth Weight

The birth weight in the prolonged labors was studied. The range of weights was similar to the normal range; but the average infant weight was slightly higher than normal, and the mean weight was 7 lb. 10 oz. There were no exceptionally large infants-although six were over 91/2 lbs. and the largest was 9 lb. 12 oz.

#### Relation of Length of Pregnancy to Birth Weight

We did not find that infants born of long pregnancies (over 295 days) tended to be larger than those born nearer to the expected date of confinement.

No relationship between length of pregnancy and increased incidence of Caesarean section could be detected. Caesarean sections occurred with almost equal frequency, on or before the expected date of confinement, as during the period beyond 295 days.

In prolonged pregnancies involving infants weighing 8 lbs. or over, there was a 41% incidence of Caesarean section, as compared to the rate of 35% for this entire series. However, a 47% incidence of mid forceps operations in this group of large infants, showed a definite increase over the 24.1% mid forceps incidence for the series.

#### Types of Delivery

The analysis of the incidence of various types of delivery as shown by Fig. 2 reveals a remarkable difference between this group and the total number

FIG. 2 Deliveries at the Providence Lying-In Hospital 6/1/49 to 6/1/51

	** ***
Total deliveries	13,655
Primiparas	5,131 (37.5%)
Prolonged labor	120 ( 2.34%)

TYPE	S OF DE	LIVERIES		
	Total	Cases	Primiparous	<b>Prolonged Labor</b>
Normal	8,555	62.7%	10	8.3%
Low Forceps	3,381	24.6	36	30.0
Mid Forceps		5.9	29	24.2
High Forceps	4	0.03	0	0.0
Breech	159	1.15	3	2.5
Versions	29	0.2	0	0.0
Caesarean Section	717	5.24	42	35.0
Totals	13,655	99.82	120	100.0

of cases delivered during the same period. Only 8% of the prolonged labors were terminated normally in contrast to 62% for all cases. The incidence of low forceps in both groups were similar, being 30 and 24.6% respectively. The incidence of 24.2% for mid forceps deliveries, including as we shall see, many difficult rotations, and 35% for Caesarean section showed the widest divergence from the types of delivery in the total hospital cases.

#### X-ray Classification of the Pelves

Roentgen studies were available in 62 out of the 120 cases. These films were studied by precision stereoscopy and classified morphologically according to the method of Caldwell and Moloy. Comparison with a series of 294 consecutive pelvimetric studies revealed a close correlation between the incidence of pelvic types in the two groups as shown in Fig. 3. Except for a small discrepancy between the percentages of anthropoid pelves on the one

FIG. 3
X-Ray Classification of Types of Pelves

Types I	Insele	cted Cases	Prolonged Labor			,
				All Cases		Cesarean Section
Gynecoid	126	43%	28	45.2%	15	47%
Anthropoid	64	21.8	10	16.1	6	18.7
Android	45	15.3	8	12.9	3	9.4
Flat	15	5.1	2	3.2	2	6.2
Gyn. with narrow forepelvis	29	9.9	10	16.1	4	12.5
Anth. with gyn. tend	4	1.3	0	0.0	0	0.0
Gyn. with anth. tend		2.1	2	3.2	1	3.0
Gyn. with flat tend		0.3	0	0.0	0	0.0
And, with flat tend,		1.3	2	3.2	1	3.0
Totals	294	100.1	62	99.9	32	99.8

hand and the gynecoid pelves with narrow forepelvis on the other, there seems to be no significant difference in the distribution of the types of pelves associated with prolonged labor.

The percentage of the various pelvic inlet configurations vary only slightly from those published by Caldwell, Moloy and D'Esopo in 1934. Their figures showed fewer gynecoid (39.5), fewer anthropoid (11.6), and fewer gynecoid with narrow forepelvis (11.0), but more anthropoid with gynecoid tendency (4.6%), and more gynecoid with flat tendency (3.3%). The combined incidence of pelves characterized by narrow forepelvis, were compared in the prolonged labor series, the control group, the Caldwell and Moloy series, and those delivered by Caesarean section in our study. The incidence of these types in the various series were sur-

prisingly in agreement being 49.1, 48.3, 42.6, and 43.6% respectively. A narrow forepelvis did not seem to predispose to either prolonged labor or Caesarean section.

Roentgenographic pelvimetry was available in 32 (or 76%) of those cases that were delivered by Caesarean section. As shown in Fig. 5, the distribution of the pelvic types was similar to the

FIG. 4
Complications of Pelvic Deliveries

Type of Delivery	Number	Trauma and Shock		Morbidity
Normal	10	0		0
Breech extraction	3	0		0
Low forceps	36	Vault lacerations	1	0
		Hemorrhage	1	
		Uringry retention	1	
Mid forceps	11	Vault laceration		Urinary
		Cervical laceration	2	tract inf. 1
		Hemorrhage	1	
Forceps rotation	18	Vault laceration	5	Urinary
		Cervical laceration	2	tract inf. 1
		Complete perineal lac	2	
		Hemorrhage		
		Urinary retention	2	
Total	78	12 cases with 21		2 cases
		complications (15.2%)		(2.56%)
Maternal mortality		None		, ,,,,

other series. It is interesting to note that in 23 of the 32 cases examined roentgenologically the presenting part was engaged; and, that 66% of those unengaged were studied more than 2 weeks prior to delivery. Whereas, those with the presenting part engaged were examined just before or during labor. Some degree of convergence was also demonstrable in  $\frac{2}{3}$  of these cases that were treated by Caesarean section.

#### Complications and Morbidity

The serious complications in our series occurred primarily in the mid-forceps group and especially in those deliveries involving posterior and transverse arrested positions, necessitating forceps rotation as indicated by Fig. 4. There were complications in a small percentage (8.4%) of the low forceps deliveries, and two of these cases were described as moderately difficult deliveries which suggests they might have been classified as mid-forceps operations.

The incidence of complications and morbidity increased with the difficulty of the operation as clearly shown. Twelve of 78 pelvic deliveries were accompanied by complications (cervical, vaginal, or perineal lacerations and hemorrhage) resulting in an incidence of 15.2%, whereas the incidence of complications accompanying mid-forceps deliveries was 34.2%. Morbidity occurred in two mid-forceps operations for an incidence of 2.5%.

The incidence of complications (9.5%) occurring in Caesarean sections as shown in Fig. 5 were limited to four (4) cases. These complications were continued on next page

FIG. 5 Caesarean Section.

Sections	No.	Complications	No.	Morbidity No
Laparotrachelotomy	32	Rupture of bladder	1	Endometritis
		Hemorrhage	2	Pelvic abscess
Extraperitoneal	10	Peripheral neuritis		URI
		(pressure)	1	Endometritis
		Hemorrhage	2	Wound inf
				Urinary
				tract inf
Totals	42	4 cases with 6 complications (9.5)	%)	10 cases (23.8%)
Maternal Mortality		None		

hemorrhage, peripheral neuritis, and rupture of the bladder which occurred in an attempted extraperitoneal Caesarean section. The maternal morbidity of 23.8% associated with Caesarean section showed a tendency to occur in extraperitoneal Caesarean sections which is considerably greater than the 16.6% incidence associated with Caesarean section in this hospital. There was no maternal mortality in this series of prolonged labor.

#### Fetal Mortality

The incidence of fetal mortality was remarkable in that all but four infants were born in good condition. There was one infant reported to be in fair condition at birth which was discharged in good condition; one infant who had a tracheo-esophageal fistula was transferred to another hospital for corrective surgery; one infant died of cerebellar hemorrhage 23 hours after a spontaneous delivery; and two stillborn infants died early in labor, with no cause being ascertained at autopsy.

This fetal mortality of 2.5 per cent, as indicated in Figure 6, compares favorably with the 2.9 per

FIG. 6 Fetal Mortality

Type Delivery	Number	Mortality
Normal	10	1—Died after 23 hours Cerebellar Hemorrhage (Autopsy)
Breech	3	0
Low forceps	36	1—Died in Labor; Autopsy Negative
Mid forceps	11	0
Forceps rotations	18	1—Died in Labor; Autopsy Negative
Caesarean Section	42	0
Total	120	3 (2.5%)

cent gross fetal mortality rate in the hospital during the period of study when considering that the prognosis for the infant in cases of prolonged labor is admittedly less favorable.

#### COMMENT

A study of prolonged labor has been conducted, analyzing 120 cases occurring in 5,131 primiparas, for an incidence of 2.34 per cent. The low incidence of prolonged labor in this series is attributed to the strict criteria which were required for inclusion. We feel that there is a strong possibility that many cases of primary uterine inertia (if, indeed, there is such an entity), may have been omitted for lack

of concrete evidence of the existence of labor during the early stages. The effect of this careful selection of cases influences strongly the statistical results and accounts for many of the apparent discrepancies between our results and those reported by others.

The mothers in this series did not appear to be older than in the hospital population but this may well be explained by the fact that some elderly primigravidae, not making satisfactory progress after 24 hours of labor, were probably delivered by Caesarean section. The same is undoubtedly true of transverse positions and cases with obstructing tumors.

No increase in tendency toward prolonged labor in cases of prolonged pregnancy could be detected from this study.

The incidence of types of delivery as compared to hospital incidence and to other series of prolonged labor present some interesting differences.

As can be seen in Figure 2, 40 per cent of the deliveries were easily conducted. Caesarean section was the method of delivery in 35%, and mid-forceps deliveries constituted the bulk of the remaining 25%.

These figures are at wide variance with those published in 1949 by Bradford and Woltz, who had a Caesarean section rate of only 13 per cent and a mid-forceps incidence of 56 per cent in spite of a slightly higher incidence of prolonged labor (3.0%) in their 2600 cases.

The results of our study reflect the trend away from difficult deliveries as advocated by D'Esopo and others, toward, what they consider, the more conservative Caesarean section.

The indication for Caesarean section was cephalo-pelvic disproportion in 86 per cent of the cases which indicates that the management of labor was conservative.

Five cases were treated by pitocin stimulation during labor for what was thought to be primary inertia. Three were eventually delivered by Caesarean section and the other two cases sustained maternal or fetal injury during difficult mid-forceps deliveries. We do not mean to imply that there is no place for such stimulation, but careful selection of cases and evaluation of results must be an inherent part of the management.

Inasmuch as the mid forceps operations contributed approximately 80% of the complications and in view of the fact that the nature of the morbidity in Caesarean sections was relatively benign, the experience drawn from this series supports the recommendations of Randall and D'Esopo. It is not felt that the high incidence of Caesarean section in this study shows a departure from the general conservative attitude at this hospital. The tendency to allow these patients to have a good test of

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labor and to be delivered, subsequently, by Caesarean section represents close adherence to the conservative policy, the wisdom of which is indicated by the low maternal morbidity, 24%, and the absence of maternal mortality.

These cases of prolonged labor were initially considered to be favorable for pelvic delivery, consequently, conservative management was adopted, until re-evaluation indicated the necessity of a change in policy in the 42 cases which were delivered by the abdominal route. The presenting part appeared engaged in 75% of those examined roent-genologically yet pelvic delivery was later deemed inadvisable. This fact clearly indicates the importance of the midplane of the pelvis, and, that engagement is not tantamount to pelvic delivery.

X-ray pelvimetry should not be the sole deciding factor in determining whether delivery should be conducted pelvically or abdominally, since only one of several variables is measured. The intensity of uterine contractions and the moldability of the fetal skull are variables which cannot be evaluated without a trial of labor. However, x-ray pelvimetry is a beneficial guide both in the intelligent management of desultory labor and in the utilization of the larger pelvic diameters during forceps deliveries. Fully as important as the measurements of the pelvic inlet are its morphologic configuration and the diameters of the mid-pelvis and the pelvic outlet.

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The excellence of the fetal mortality rate, 2.5 per cent, in this series is emphasized by comparison with Beck's series of 79 long labors in 1922 in which he reported a fetal loss of 7.6 compared to a gross hospital fetal loss of 3.0 per cent. In his series, he also reported the loss of one mother.

Bradford and Woltz in 1949 reported an uncorrected fetal mortality rate of 5.0% (1.25% corrected) in 79 cases of prolonged labor in which there was a Caesarean section incidence of only 13 per cent.

#### Conclusions

1. Increased age did not contribute to the incidence of prolonged labor in this series, but no general conclusions regarding this relationship could be drawn.

2. Long pregnancies extending beyond 295 days did not seem to be associated with prolonged labors.

3. Following prolonged labor the incidence of serious complications was high in that group delivered by mid-forceps operations.

4. Prolonged labor showed no prediliction for any particular type of pelvis.

5. Caesarean section performed after a long labor was safer than difficult mid-forceps operations

6. X-ray pelvimetry should be merely an adjunct in the management of labor, and finally

7. The results of conservative management of prolonged labor compared very favorably with the reports in the literature.

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#### CANCER CONFERENCE FOR PHYSICIANS

Abstracts from Lectures presented at the Fifth Annual Cancer Conference for Physicians held under the Auspices of the R. I. Medical Society at the Pawtucket Memorial Hospital, October 15, 1952

None of us have time to read as much medical literature as we would find worthwhile. Many of us have adopted the habit of running through the magazines reading the conclusions. This gives us a worthwhile inkling of what is going on in many branches besides our own. Occasionally we will be stimulated by these conclusions to read the whole paper.

At the 5th Annual Cancer Conference for Physicians recently held at Memorial Hospital, Pawtucket, there were some excellent talks not given in such a manner that we could print them in our Journal. Several of the lecturing physicians gave short summaries or conclusions about their paper. We think it worthwhile to print those short summaries here. It may stimulate some of you to further reading of articles in which these authors have elaborated their ideas.

... THE EDITOR

#### EARLY DIAGNOSIS OF CANCER OF THE LUNG

Richard H. Overholt, M.D. of Boston, Massachusetts. Clinical Professor of Surgery, Tufts College Medical School.

In the last War, the Army and Navy used radar to detect the presence of an enemy before it was in a position to strike a fatal blow. Medical science has developed an equivalent of radar which can detect the presence of serious enemies of man which attack by first destroying parts of the lung, then the individual himself. The radar of medicine is mass radiography which can be used to screen the chests of all individuals for possible enemy invasion.

Cancer of the lung, as well as tuberculosis, at first usually passes through a long, silent phase. Its presence does not escape x-ray detection, however. Minor changes in the density of the lung show up as abnormal shadows on a survey film. There are then safe and accurate methods to determine the true nature of the condition which has caused the abnormal x-ray shadow. Prompt diagnosis is absolutely necessary since a cancer does not wait forever before it grows and spreads to other parts. If cancer of the lung is treated promptly during its silent phase, cure rates are high. If there are delays, cure rates drop accordingly. The lung has been

shown to be one of the most frequent sites for cancer development, and particularly is this so in men

Fortunately, this common cancer is the most detectable of all internal cancers. With the use of chest screening and present treatment methods, cancer of the lung can be the most curable of all internal cancers.

#### RELATION OF BENIGN LESIONS OF THE BREAST TO THE DEVELOPMENT OF CARCINOMA

A. Purdy Stout, M.D., of New York City. Professor of Pathology, Columbia University College of Physicians and Surgeons; Pathologist, Francis Delafield Hospital, New York.

There are a number of conditions which produce either one or more lumps in women's breasts which prove to be non-cancerous when examined with the microscope. Some of them have been regarded in the past as indications that cancer is more apt to develop in that breast than if there had not been such a benign growth and the whole breast has been removed to prevent it. The investigations carried out at the Columbia-Presbyterian Medical Center and the Francis Delafield Hospital in New York as well as elsewhere indicate that these benign growths cannot be considered evidence of a precancerous state in the breast and are not a justifiable reason for removing one or both breasts.

# THERAPY OF MALIGNANCY IN CHILDHOOD

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Sidney Farber, M.D., of Boston, Massachusetts. Professor of Pathology, Harvard Medical School; Scientific Director, Children's Cancer Research Foundation.

Cancer in children is now a leading cause of death, varying from first to second place in the ages from one through fourteen. Some forms of cancer are curable by surgical removal with or without the aid of roentgen radiation. Signs of cancer of great value in leading to a diagnosis in *adults* with cancer, such as hemorrhage, pain, persistent hoarseness, difficulty in swallowing, change in bowel

habits, unusual bleeding or discharge are usually not present in children. For this reason the speaker almost 20 years ago proposed the following generalization:

Every solid mass, or semi-solid, semi-cystic mass in an infant or child should be regarded as a malignant tumor until its exact nature is determined by microscopic examination of the removed tumor.

Early surgical removal of the embryoma of the kidney, for example, has resulted in cures ranging from 40 to 80%, particularly when followed by roentgen radiation. Cures in this kind of tumor

were almost unknown 25 years ago.

Teratomas or malformations which have developed into true tumors, such as those attached to the tip of the spine may reach a size larger than the head of the child. If removed completely before the age of one year, cures may be obtained in more than 80%. Slowly growing tumors of the brain may be removed with cures in increasing numbers. A partial list of other malignant tumors in children which may be cured by surgery with or without x-ray treatment, includes tumors of the adrenal gland, (just above the kidney) such as the neuroblastoma and ganglioneuroma; tumors of the soft tissues of the limbs (not arising in bone) such as the liposarcoma and fibrosarcoma; tumors of the brain and spinal cord such as the dermoid cyst, the craniopharyngioma; certain ependymomas, and numerous astrocytomas; some neurofibrosarcomas arising from the nerve sheath in any one of a number of parts of the body.

Some forms of cancer spread to other parts of the body before it is possible to even suspect the diagnosis of cancer. Most tumors arising in bone behave in this way. Cures, therefore, are rare after surgical removal of a limb. For the treatment of children with such tumors which have become widespread before recognition and for the treatment of those children who have tumors which are widespread from the very beginning, such as acute leukemia, Hodgkin's disease, lymphosarcoma, new forms of treatment have come from the research laboratories. These are combined with the techniques of surgery when indicated, roentgen radiation, hormone therapy, radioactive isotopes and more recently the use of chemicals taken by mouth or injected into the body (chemotherapy). The use of two or more of these forms of treatment as part of the total care of the child with widespread cancer has resulted in prolongation of life in many children, in an improvement in the state of health and return to a condition approximating the normal in some and, in a few instances regarded as hopeless just five years ago, even to cure.

The use of new chemicals, such as the folic acid antagonists (aminopterin, amethopterin, etc.) has

changed the outlook in acute leukemia in children from invariable death in a few weeks to several months, to marked improvement and prolongation in life in two-thirds of all children treated. Many have survived up to two years, and one child is still alive 43 months after the onset of the tumor. Children with tumors involving the lymph nodes all over the body (Hodgkin's disease, lymphosarcoma, chronic leukemia) and children with widespread cancer originating in the adrenal gland above the kidney (neuroblastoma) have responded to the combination of chemotherapy, x-ray treatment and general care with long increase in survival and marked improvement in general health approaching, in some instances, an apparently normal state.

There is no universal cure for cancer, nor is there any single form of treatment which may be applied to all children with widespread cancer formerly regarded as incurable. The combined, or team approach to treatment of cancer in children based upon the principle of total care, with the application of the results of research as rapidly as they are available for the child with "incurable cancer" gives promise for the future on the basis of experience of the past five years. It should be emphasized, however, that at the present time certain forms of cancer in children regarded 25 years ago as hopeless are being cured by surgical and x-ray techniques alone when early diagnosis is possible.

#### P.M.A.

Accident and Sickness Insurance

In September, 1949, the Providence Medical Association approved a plan of Disability Insurance especially for its members. Much care and study was given to select a plan which would be stable and permanent, while allowing all members under age 70 to participate. Most of our members have supported this excellent activity with the result that nearly \$50,000 has been received by disabled members since then.

This insurance has been tried and proven! We hope that the members not now participating in the Plan will add their names to the list of insured members, thus insuring excellent benefits to themselves and added security for others in the plan.

Information may be obtained from the Executive Secretary's office or from the Derosier Agency.

This plan should not be confused with other mail order plans which do not have the strength and dependability of your locally operated and sponsored plan!

R. A. Derosier Agency 32 Custom House Street Providence 3, Rhode Island GAspee 1-1391

#### AIR POLLUTION AND CANCER OF THE LUNG\*

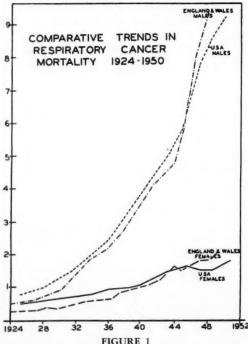
W. C. HUEPER, M.D.

The Author, W. C. Hueper, M.D., of Bethesda, Maryland. Chief, Cancerigenic Research Studies Section, Cancer Control Branch, National Institute of Health.

MORTALITY DATA contained on death certificates and based on autopsy observations as well as morbidity data collected in recent years in the United States attest the fact that there has occurred during the past five decades a marked and progressive increase in the absolute frequency of cancer of the lung. This development also reported from practically all other industrialized countries has gained momentum during the last two decades. It has lately become a convenient expedient for some investigators to explain away this distinctly unpleasant, if not alarming observation by attributing it to changing fashions in certification of causes of

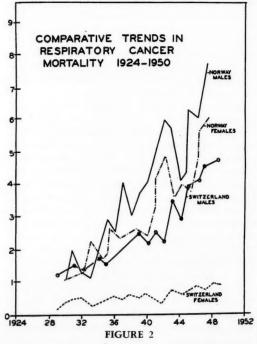
deaths, increased awareness of the medical profession of lung cancer, improved diagnostic methods and facilities, progressive aging of the population, reduction in the number of deaths from other diseases and similar half and part truths. However, to the critical student there exists little if any doubt that an appreciable portion of this development is real and that we are confronted with a serious situation deserving prompt and earnest attention by the medical profession at large as well as by other official and private parties, such as public health agencies, labor departments and labor organizations, industrial management and the general public.

The following graphs (figs. 1 and 2) illustrate strikingly the course of events in this country and abroad during the past four (4) decades. With the exception of Norway, there was chiefly ob-



\*Presented at the 5th Annual Cancer Conference for Physicians, under the auspices of the Rhode Island Medical Society, at the Memorial Hospital, Pawtucket, R. I., October 15, 1952.

Figs. 1, 2 and 4 are modifed from data of Daff, M. E. and Kennaway, E. L., The Arsenic Content of Tobacco and of Tobacco Smoke. Brit. J. Cancer 4:173-182, 1950



served a rapid rise in the frequency of lung cancer among males. Heady and Kennaway noted a ninefold increase of lung cancer in men in England and Wales between 1928 and 1947. The age-adjusted mortality rate for lung cancer in the United States rose from 2.7 per 100,000 population in 1930

to 11.0 in 1948, a more than fourfold increase.

Apart from the fact that males were affected by lung cancer not only to a disproportionate but also to an increasing degree, it is characteristic of the development that it started in different countries at different times, that it involved some parts, and usually the industrialized parts of individual counttries to a higher extent than others, and that it progressed in the various countries at varying speed. Since fundamental changes in the biologic composition and reactivity of the population groups involved cannot account for this development because such alterations would require the participation of several generations, the principal attention must be focused on new or old environmental carcinogenic factors appearing and operating to an increasing degree during the last 75 years.

In view of the fact that the increased frequency of lung cancer seemed to affect the population in general and not any special occupational or socio-economic group in particular, the principal interest centered on the possible role which carcinogenic pollutants of the air might have played in bringing about this development. This concept received some support from the fact that not only the majority of the known or suspected occupational carcinogens discovered after 1900 caused cancers of the respiratory tract, but that some of them apparently were present as local or general contaminants of the air, following their release as industrial wastes, as pesticides, or as combustion products of gasoline and fuel oils. In addition to the possible carcinogenic

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role of air pollutants inhaled for general environmental or occupational reasons, a great deal of attention has recently been given to the widespread but highly personalized air pollution created during the process of tobacco smoking.

An effective future control of the factors responsible for the phenomenal rise in lung cancer frequency obviously depends on the demonstration and identification of the causal factors and on a proper assessment of the relative importance of the individual factors involved. A critical appraisal of our presently available knowledge on these two points represents the first and basic step in this procedure.

2. Geographical Distribution

The concept that exogenous factors, entering the human environment some 50 to 75 years ago and acting in increasing intensity, are responsible for the recent increase in lung cancers is supported by epidemiologic observations, related to the geographical distribution of pulmonary cancers. The data on the incidence of respiratory cancer, 1937 and 1947, in eight metropolitan centers (table 1) reveal striking differences in the lung cancer morbidity rates of different centers, the extremes being 39.1 per 100,000 population, males, 1947, in New Orleans and 13.4 per 100,000 in Atlanta.

The percentages of increase in frequency for these communities also were far from uniform. Since the most marked discrepancies on these two points occur among metropolitan areas (New Orleans and Atlanta) located in the same part of the country (Southern States), it is most unlikely that continued on next page

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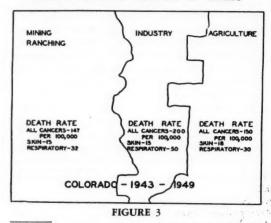
TABLE 1
Incidence of Respiratory Cancer, 1937 and 1947
Morbidity Rates for Eight Metropolitan Centers, by Sex
per 100,000 population\*

				L. Lunn					
	Males Females				Females			Total	
Primary Site and City	1937	1947	Percent Increase	1937	1947	Percent Increase	1937	1947	Percent Increase
Bronchus and Lung									-
Atlanta	5.0	13.4	168	1.0	5.0	400	2.9	8.9	207
New Orleans	13.1	39.1	198	2.8	4.2	50	7.6	20.8	174
Dallas	5.9	29.0	392	0.5	6.4	1180	3.1	17.2	455
Birmingham	4.5	18.9	320	2.1	3.9	86	3.3	11.0	233
Denver	9.1	21.9	141	4.2	8.1	93	6.6	14.8	124
San Francisco	15.6	34.3	120	3.9	8.1	108	9.8	20.8	112
Chicago	13.3	29.5	122	4.3	7.0	63	8.8	18.0	105
Pittsburgh	9.7	26.1	169	4.9	5.5	12	7.3	15.6	114
Larynx									
Atlanta	1.4	4.0	186	0.3	0.3		0.9	2.0	122
New Orleans	11.3	14.9	32	0.4	1.0	150	5.6	7.6	36
Dallas	3.2	5.3	66	1.5	0.4	73	2.3	2.7	17
Birmingham	1.4	4.0	186	0.0	1.3		0.7	2.6	271
Denver	2.0	4.1	105	0.0	0.0		0.9	2.0	122
San Francisco	4.5	8.8	96	0.2	0.8	300	2.4	4.6	92
Chicago	6.7	7.0	4	0.4	0.6	50	3.5	3.7	6
Pittsburgh	4.4	8.0	82	0.4	0.8	100	2.4	4.4	83

\*Biometrics Section National Cancer Institute differences in the genetic-biologic composition of the populations or fundamental variations of the smoking habit between these populations can be responsible for them. It is, therefore, much more probable that occupational, industrial or other environmental factors related to living conditions account for these regional variations.

Similar variations appear if cancer mortality data for different States and different areas of States are analyzed. When Colorado is divided into three regions according to predominating types of occupational activities (eastern part with agriculture, central part with industry, western part with mining and ranching) (fig. 3), it appears that the highest lung cancer death rate exists in the central, industrialized portion (50 per 100,000 male deaths), while the lowest is found in the agricultural area (30 per 100,000), with the western mining regions

#### SPECIFIC CANCER DEATHS IN MALES



Prepared from data supplied by Mr. F. W. Church, Dept. Industrial Med. University of Colorado

occupying an intermediary position (32). Rigdon and Kirchoff also demonstrated that lung cancer death rates for 1930 to 1934 were higher in the urban areas than in the rural ones of the forty-eight States (table 2).

Stocks; Kennaway; Kennaway and Kennaway; and Fulton also noted in their more recent studies that there was a prevalence of cancers of the lung and larynx in urban areas over rural ones. In urban populations there was, moreover, a lack of influence of social class upon the liability to lung cancer. In fact, it was shown in 1936 that for cancer of the lung in males there was a steep downward gradient from London through large and small towns to rural areas. Stocks suggests that the only explanations of these results which seem adequate were that either smokiness of atmosphere is an important factor in itself in producing cancer of the lung, or sunshine is an important factor in preventing its incidence.

#### 3. Atmospheric Pollution

The topographical distribution pattern displayed by respiratory cancers clearly suggests the action of an environmental agent which is present or operative to a higher degree in urban and industrialized regions than in rural areas. Air pollution from effluents of domestic fireplaces, incinerators, industrial establishments, and carbon black plants, exhaust fumes from gasoline and diesel engines and coal or oil-fired railroad locomotives, dust from asphalted, tarred and oiled roads and from abrasion of rubber tires (Sharrah), would perhaps best conform with this pattern.

The three main sources of potentially carcinogenic air pollution are represented by (a) the specific hydrocarbons which are contained in the combustion and distillation products of carbonaceous matter; (b) arsenicals released as fumes from metallurgical establishments (smelters), and coalburning furnaces and power plants or as dust fol-

# TABLE 2 Lung Cancer Death Rates in the 48 States of the United States in 1946 and 1948 Crude Death Rates per 100,000

Industrialized States				
State	1946	1948		
Connecticut	8.5	11.1		
Illinois	8.1	8.2		
Maryland	6.5	8.4		
Massachusetts	10.4	10.2		
Michigan	5.7	7.1		
New Hampshire	7.4	10.1		
New Jersey	9.7	9.7		
New York	10.2	11.9		
Ohio	6.0	7.3		
Pennsylvania	6.7	8.4		
Rhode Island	8.7	7.4		

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States with Regional Industrialization					
State	1946	1948			
Florida	6.8	7.4			
Louisiana	6.5	8.5			
Missouri	7.3	9.4			
Montana	10.0	8.8			
Nebraska	5.7	8.0			

Agricultural States				
State	1946	1948		
Alabama	4.0	5.1		
Arkansas	3.6	5.4		
New Mexico	2.6	3.0		
North Carolina	3.1	4.0		
North Dakota	5.6	4.1		
Oregon	4.1	4.4		
South Carolina	3.6	3.7		
Washington	5.1	4.2		
Wyoming	4.9	3.9		

The death rates for the year 1946 were taken from "The American Cancer Society, Inc., 1949, Cancer Death Rates for each State in the United States by Site"; those for the year 1948 were produced by the National Office of Vital Statistics (Rigdon and Kirchoff).

lowing their use as pesticides; (c) radioactive matter present as gases and fumes in the effluents from industrial and military radioactive operations, and radioactive reaction and decay products of atomic

energy plants (Smith; Lowry).

(a) Domestic soot, which may consist of up to 40 percent of tarry matter (Cohen and Ruston) and which is the chief atmospheric contaminant, contains, according to Goulden and Tipler, 3,4-benzpyrene (300 mg./kg. in a mixed sample) representing one of the carcinogenic agents present in coal tar and shale oil (Berenblum and Schoental). The same carcinogenic chemical has recently been demonstrated in carbon blacks which form a major constituent of automobile tires (Falk and Steiner). It has been established by English and American investigators that the exhaust of gasoline and diesel engines contains benzpyrene (Waller) which was demonstrated in automobile lubricating oil.

Recent studies of Waller showed that samples of smoke drawn from the air at eight different towns in England contained benzpyrene. The concentration of benzpyrene rose sharply during the winter, and there was a tendency for the mean annual values to increase with the size of the town. The average benzpyrene concentrations during smog days increased fourfold (from 7.2 mg. per 100 m<sup>3</sup> to 32.8 mg.).

(b) Extensive pollution of the air with arsenical effluents from metal ore smelters was especially in past decades, a well-recognized fact giving rise to damage to crops and wild and domesticated animals (Hofmann; Prell; Nieberle). It was an unavoidable while usually circumscribed complication of large scale dusting and spraying operations with arsenical pesticides. The contamination of the air of cities with arsenical impurities from the combustion of coal doubtlessly is in general of a much lower order.

The human epidemiologic evidence on pulmonary cancer caused by an environmental arsenical air pollution is practically non-existent, unless the observations made during recent years in several counties in Montana having copper ore smelters provide what might be considered suggestive evidence (table 3).

Of distinctly greater significance, on the other hand, are the observations made in regard to the continued on next page

TABLE 3
Lung Cancer Mortality in Several Counties
of Montana, 1947-1948

County and Total Population Major		Number Lung Cancers			Total Cancer	% Lung Cancer		Annual Lung Cancer Death Rate/100,000	
1940	Industry	Male	Female	Total	Deaths	Male	Female	Male	Female
Deer Lodge 13,627	Copper Smelting	21	0	21	98	30.8	0.0	145.7	
Silver Bow 53,207	Copper Mining	27	2	29	259	22.6	1.5	48.6	3.9
Cascade 41,999	Copper Mining Smelting	20	5	25	299	12.7	3.5	46.3	12.3
Gallatin 18,269	Agriculture	1	0	1	81	3.0	0.0	5.2	

The estimated crude death rate for lung cancer among white males in the entire United States in 1947 is 10.9 per 10,000 population.

TABLE 4
Occupational Groups With An Excessive Lung Cancer Incidence

Occupational Group

Investigator

Metal workers, welders, metal grinders and polishers, wire makers, tool and die makers, foundry workers, metal moulders, lathe workers, etc.

Cigar manufacturers and tobacconists

Engineers; mechanics; machinists, plumbers, etc.

Painters, decorators

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Tar workers, road workers, asphalters, paviours, stokers, patent fuel workers, furnace men, foundry laborers, rollers, etc.

Borst; Kennaway and Kennaway; Turner and Grace; Mueller; Dublin and Vane; Wynder and Graham; McLaughlin

Seyfarth; Borst; Kennaway and Kennaway; Enger; Versluys; Brinkmann

BECC\* 1944 and 1952; Gillespie; Turner and Grace; Mueller; Wynder and Graham

BECC 1944; Mueller; Dublin and Vane; Fulton; Wynder and Graham

Kennaway and Kennaway; Fulton; BECC 1952 Registrar-General (1938), McLaughlin

<sup>\*</sup>Report of British Empire Cancer Campaign.

increased or decreased frequency of lung cancer among members of certain occupational groups, especially as these data reveal a definite degree of uniformity with which certain worker groups are cited for their excessive liability although the data are coming from different investigators and obtained from different material. The information on this subject is summarized in table 4.

Recent epidemiologic studies on the frequency of cancers of various sites among the members of different industrial groups in Ohio, conducted by Mancuso provided another illustration of the existing variations in liability to pulmonary cancer among various large occupational groups (table 5).

TABLE 5

Lung Cancer Death Rate per 1000 Deaths of All
Causes For Seven (7) Industrial Groups in Ohio,
1947 Among 5309 Male Cancer Deaths

Industry	% Respiratory Cancer
Iron and Steel	2.18
Transportation	2.91
Agriculture	0.82
Rubber and Plastics	2.34
Stone, Clay, Glass	0.66
Non-Ferrous Metal	3.22
Mining and Quarrying	1.53
Total	1.76

These rather crude rates are in general agreement with the observations of other investigators, since they show an elevated lung cancer frequency for workers employed in the ferrous and non-ferrous metal industries and in transportation, and a low lung cancer rate for agriculturists.

Another possible example of an increased frequency of lung cancer among members of a special occupational group became apparent when the lung cancer frequency among operating and non-operating employees of two major railroads was determined (table 6).

The employment ratio of operating railroad workers to non-operating railroad workers of one of the two companies was 1:4. From this ratio it appears that about 75% of the lung cancers listed for railroad employees of these two companies occurred among the operating group which represents only 25% of the total number of employees. Operating railroad workers included engineers, firemen,

conductors, men in the roundhouses and switchmen. If the action of environmental carcinogens should mainly account for the striking increase of lung cancer frequency and for its irregular course in different regions and conditions, industrial and industrially related carcinogens would well fit this pattern, since the growth of industrial establishments and the use of their products in the economic life of different countries and communities have greatly lacked uniformity in time, type and extent (Hueper).

Rather far reaching, if not extravagant, claims recently have been advanced as to the important, if not predominant role which the personalized type of air pollution related to cigarette smoking is alleged to have played in the production of lung cancer and its progressive rise in frequency during the past 50 years. A critical and sober analysis of the evidence offered in support of these assertions is in order not only for reasons of scientific accuracy but also for medicolegal reasons and especially for determining the direction of future epidemiologic research and of control activities in the field of lung cancer.

Müller in 1939 did the first statistical study on the relation of tobacco smoking to lung cancer by comparing the relative intensity of the smoking habit (cigarettes, cigars, pipe) among the members of a series of 86 lung cancer patients with the intensity distribution among a normal control group (table 7). According to the occupational data given, there were among the 86 cancer cases, 19 male individuals occupationally exposed to metal dusts and fumes, lubricating oil mist and soot, 12 exposed to soot and automobile exhaust, 11 exposed to ingredients of paints, and one (1) exposed to chromates, while of the 10 female cancer cases, three (3) had worked in an ammunition plant and one (1) in a cigarette factory. A possibly significant occupational exposure history thus existed in 43 of the 76 male cases and in perhaps four (4) of the 10 female cases.

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While these discussions of a possible causal relation between cigarette smoking and lung cancer first aroused little attention beyond the narrow circle of research workers, the problem started to attract wide attention from the medical profession, public press, industry, and laity after the publication of the papers of Schrek, Baker, Ballard and Dolgoff

TABLE 6
Lung Cancer Frequency among Operating and Non-Operating Railroad Workers

Railroad	Period	Total No. Lung Cancers	Operat	Cancer ing RR rkers	Lung Cancers Non-Operating RR Workers		Lung Cancers Unde- termined RR Workers	
			No.	%	No.	%	No.	%
A	1940-1950	29	24	83	5	17		
В	1939-1949	105	59	66.5	15	15	30	28.5

TABLE 7

Degree of Tobacco Consumption among 86 Lung Cancer Cases and 86 Normal Controls

Degree of Tobacco Consumption		ighly cessive	Ve	ry Heavy	I	<b>Ieavy</b>	Мо	derate	Non-S	Smokers
	No. of Cases		No. of Cases		No. of Cases		No. of Cases		No. of Cases	
% of Degrees Among Lung Cancer Series	29	(25)	21	(18)	15	(13)	31	(27)	4	(3)
% of Degrees Among Normal Controls	5	(4)	6	(5)	25	(22)	48	(41)	16	(14)

and of Wynder and Graham in 1950. There followed in rapid succession a number of statistical investigations of this problem from this country and abroad (Levin, Goldstein and Gerhardt; Breslow; Ochsner, DeCamp and DeBakey; Graham; Wynder; Mills and Porter; Dungall; Doll and Hill; Daff and Kennaway; Daff, Doll and Kennaway; Gsell). From the results of these studies the following conclusions were drawn by these investigators:

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Wynder and Graham: Excessive and prolonged use of tobacco, especially cigarettes, seems to be an important factor in the induction of bronchiogenic carcinoma. Among 605 men with bronchiogenic carcinoma, other than adenocarcinoma, 96.5 percent were moderately heavy to chain smokers for many years, compared with 73.7 percent among the general male hospital population without cancer.

Schrek et al.: The correlation between smoking and cancer is probably not due to fortuitous or secondary factors. It seems plausible, therefore, to formulate the hypothesis that there is a direct relationship between cigarette smoking and cancer of the respiratory tract and that cigarette smoking may be a carcinogenic agent. This relatively low percentage of deaths by cancer of the respiratory tract compared to the high percentage of smokers indicates that smoking is, at most, only a weak carcinogenic agent.

Ochsner, DeCamp and DeBakey: There is a distinct parallelism between the sale of cigarettes and the incidence of bronchogenic carcinoma. Because the carcinogenic effect of cigarette smoking does not become evident until after many years of smoking (approximately 20), it is frightening to speculate on the possible number of bronchogenic cancers that may develop as the result of the tremendous numbers of cigarettes consumed in the two decades from 1930 to 1950. If there is a causal relationship between cigarette smoking and bronchogenic carcinoma the deaths per 100,000 population from this cause may be expected to increase from 11.3 to 29.4 by 1970.

Levin, Goldstein and Gerhardt: These data support the conclusion that lung cancer occurs approximately 65 percent more frequently among males who have smoked cigarettes for 25 years or more than among males who have smoked cigars or pipes for a comparable period or non-smokers. The data indicate also that pipe and cigar smokers have no higher incidence of lung cancer than non-smokers. The findings suggest, although they do not establish, a causal relation between cigarette smoking and lung cancer.

Mills and Porter: Among cancers of the respiratory tract from the larynx downward, an abnormally high percentage of cigarette smokers, as well as of pipe and/or cigar users, is found. This group of cancer victims exhibits significantly increased

percentages in all forms of smoking.

Doll and Hill: Among the smokers a relatively high proportion of the patients with carcinoma of the lung fell in the heavier smoking categories. Smoking is a factor, and an important factor, in the production of carcinoma of the lung. The risk of developing carcinoma of the lung increases steadily as the amount smoked increases. Cigarette smoking was more closely related to carcinoma of the lung than pipe smoking. No distinct association was found with inhaling.

It appears from the speculations of Doll and Hill that among the population of Greater London over the age of 45, those who smoke 25 or more cigarettes a day, had an approximately fifty times greater chance of developing cancer of the lung than non-smokers of similar age. Assuming that these conclusions are essentially correct, it may then justly be argued that an effective control of cigarette smoking offers the means for a far-reaching prevention of cancer of the lung. The statistical data which form the basis of these conclusions are summarized in table 8. Brunner found among 127 lung cancer patients 27 percent heavy smokers and 9.5 percent non-smokers.

While some of the not inconsiderable differences in the relative percentages of smokers of various degrees are doubtlessly due to the use of different standards in the classification used, this explanation, however, does not hold for the proportion of non-smokers listed by the different investigators. The percentage range for non-smokers is from 1.3 to 14.6 percent for the various lung cancer groups and from 8.8 to 30.5 percent for the control groups. These discrepancies suggest the existence of differ-

continued on next page

TABLE 8
Statistical Correlations between Tobacco Smoking and Lung Cancer

Degree of Smoking Habit Among Lung Cancer Patients (Males)

Authors H	lighly Excessive	Very Heavy	Heavy	Moderate	Non-Smoke	ers
Schrek et al.	18.3	50.0	)	12.2	14.6	Cigarettes, only, balance pipe and cigars
Wynder and Graham	20.3	30.9	35.2	12.4	1.3	
Doll and Hill	5.0	21.0	30.3	38.6	5.1	
Breslow	15.3	50.7	19.5	3.5	9.0	
Gsell Controls:	30.0	37.0	21.0	10.5	2.0	
Wynder and Graham	7.6	11.5	35.6	30.5	14.6	
Doll and Hill	2.1	11.4	30.5	47.1	8.8	
Breslow	3.5	34.8	18.8	11.1	30.5	

ences in the basic composition of the human material evaluated. The validity of this concept also is supported by the fact that the various investigators noted rather widely varying proportions of adenocarcinomas in males and females in their respective series. The histologic type of pulmonary cancer is predominantly of the epidermoid variety among males, while a considerable proportion of these tumors among women are of the adenocarcinomatous kind [36.4% in females, 4.5% in males (Gsell); 52% in females; 18% in males (Proc. First Nat. Cancer Conf.); 13.7% in females, 6.7% in males (Mason); 52% in females, 0.6% in males (Wynder and Graham)]. It was noted also that a history of heavy smoking was less often elicited from patients with adenocarcinoma than in those with epidermoid carcinoma (Gsell; Wynder and Graham).

The apparent lack of uniformity in the human material analyzed by the different authors is further demonstrated by the appreciable differences in the sex distribution of lung cancers reported at different times, from different regions and by different investigators. The male to female sex ratio fluctuates between 2:1 to 20:1 (Hueper). It is noteworthy, however, that the uniformly observed prevalence of lung cancer among males has in general become in recent years even more pronounced than in former decades. This observation strongly militates against a predominant causal role of cigarette smoking in the production of lung cancer, because all previous experience in the field of occupational cancer indicates that given the same type of carcinogenic exposure for both sexes and at the same time an increasing equalization of the intensity of exposure, there occurs a narrowing of the gap in incidence rates of the two sexes and not a widening, which actually exists. This interpretation of the diverging sex related frequency trends

is not fundamentally affected by the statement that the interval between the start of tobacco smoking and the appearance of a lung cancer is between 20 to 40 years (Wynder and Graham; Ochsner, DeCamp and DeBakey; Schrek, Baker and Ballard). Even, if women may not have indulged on a large scale in tobacco smoking some thirty years ago, there can be little doubt that the cigarette smoking habit has made during this period much greater strides among women than among men.

The purely statistical approach leading to the assumption of the existence of causal relations between two coincidental events and trends is, thus, in urgent need of supporting biologic evidence in man, since the available experimental evidence gave equivocal results.

Attempts to produce cancers of the skin in mice and rabbits by the topical application of tobacco tar were either unsuccessful or rendered positive results in only a few of the animals treated, indicating that at best tobacco tar is a weak carcinogen. Similarly discouraging were experiments in which mice inhaled tobacco smoke over long periods of time for the purpose of producing pulmonary tumors. It must be noted, however, that the experimental conditions observed resembled those existing in smoke-filled rooms and were fundamentally different from those existing in man when smoking cigarettes, cigars or tobacco.

Although Roffo claimed to have demonstrated by spectrographic methods the presence of 3,4-benz-pyrene, a recognized carcinogenic hydrocarbon, in tobacco tar, this allegation could not be confirmed by subsequent and reliable investigators (Schürch and Winterstein, Cooper, Lam, Sanders and Hirst; Waller).

While the failure to demonstrate 3,4-benzpyrene in tobacco tar does not exclude the possible presence of other carcinogenic chemicals in this material, it

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#### REPORT ON THE HEALTH NEEDS OF THE NATION

THE PRESIDENT'S COMMISSION on the Health Needs of the Nation released a 282-page report too comprehensive to review here.

In many areas we can agree with the Commission's findings. In the most important area, however, we find plenty of room for disagreement.

The Commission recommends that co-operative Federal-State programs be established to assist the financing of personal health services, the local and state plans meeting Federal minimum standards; that funds collected through Old Age and Survivors Insurance be utilized to purchase service benefits on a prepayment basis for beneficiaries; that Federal grants be made from general tax revenues for the purpose of making personal health services available for public assistance recipients; that there be an advisory council representing public interests; that services to all persons to be available without discrimination, and that comprehensive services be supplied as much as local resources permit, with maximum utilization of all available to the general population.

Even this section of the report, socialistic as it is and embodying principles of National Health Insurance which we so vigorously opposed, did not meet the approval of the labor group because it allows states to participate, or to refuse to participate, as they choose. We still have with us the forces demanding comprehensive medical care for all the people financed by government grants. The proposition is unworkable, unnecessary and Un-American.

The biggest opportunity the Commission hadto come up with a worthwhile profitable suggestion for the health and welfare of the great mass of Americans — has been completely lost because the Commission allowed itself to be dominated by the thinking of those pressure groups in labor and social welfare that are still plugging for a comprehensive over-all plan paid out of tax funds. Regardless of how cleverly it is disguised, or how cleverly it is presented, it is the same socialistic propaganda. The Commission would have done much better formally to recognize that its opportunity for the proper evaluation for the health needs of the nation was too limited to make a definitive report and should therefore hold in abeyance any solution to the problem.

Its espousal of the voluntary prepayment type of medical care was inevitable because of its obvious acceptance and workability, but the Commission would have done a better job, too, if it

continued on next page

faced the issue squarely and stated, "The individual is responsible for his individual welfare and health, like he is the other necessities of life, but because of the complexities of modern living and the disruptive economic influence now present, insurance against the high cost of catastrophic illness is imperative for everyone." The development of the Voluntary insurance plans, the improvement of them with additional experience, the extension of benefits and the reduction of premiums is the goal toward which we should strive. The desires of special interests, whether they be consumers or physicians, should be recognized and should be properly evaluated. Where consumer plans would exploit physicians, we must be quick to criticize. Where physicians' plans are restrictive as to patient benefits and the physician participation, we should be equally quick to criticize.

The poor we always have with us!! They are the direct responsibility and a charge on all citizens at all times. Direct Federal, State or local subsidies for the care of the indigent and the unfortunate is inevitable, and no professed concern for their welfare should induce us to subscribe to diversion of government funds to special channels (i. e. insurance plans, etc.) in an attempt to provide care for them from these sources instead of directly

through government agencies.

When National Health Insurance was first proposed it was supposed to help the employed worker to meet his medical bills. When the fact that the unemployed worker and the poor were not covered by it was noted, its cause was materially weakened because most Americans are concerned with the welfare of the low-income family and the indigent. For the others, there is usually some method by which they can obtain protection. Now we are faced with a report which would obviously blanket in the unemployed, the indigent, and in an attempt to cover these people, foist on our nation a series of bureaucratic devices which would eventually form a nucleus for a National Health Insurance program.

The final recommendation of the Commission that a permanent Federal Health Commission be appointed continually to survey the field is an excellent suggestion. On the whole, the Commission has done a pretty good job under the circumstances and probably a better one than we might have confidently expected them to do. However, in the field of personal health services, we feel that a greater and continuing study is necessary before a final decision can be made or legislation drawn relating to the health and welfare of this nation.

#### FIRST IN THE UNION

The following letter from the secretary-treasurer of the United States Committee of the World Med-

ical Association is as fine a tribute to our Society as we have had in some time. We publish it in its entirety:

THE WORLD MEDICAL ASSOCIATION
United States Committee, Inc.
2 East 103rd Street
New York 29, N. Y.

December 19, 1952

Mr. John E. Farrell, Executive Secretary The Rhode Island Medical Society 106 Francis Street Providence, R. I.

Dear Mr. Farrell:

May I congratulate you and through you, the members of the Rhode Island Medical Society, who, by joining the United States Committee of WMA in such numbers, have passed the preliminary membership quota set for Rhode Island. In fact, your state was the first state in the Union to pass its quota. We hope eventually to double the quota for each state.

To me this fine showing demonstrates several important tenets. First of all, it shows that the physicians of Rhode Island, aware of the United States leadership, have accepted the obligation of advancing our high standards of medicine throughout the world. Secondly, it points to the importance of good state organization in putting across a program that helps members of the profession help themselves and their colleagues, thirdly it indicates very high readership of the *Rhode Island Medical Journal* in which you were good enough to publish a fine editorial on the "Physician of the World", and finally that the physicians of Rhode Island are in favor of free enterprise on the international level.

Yes, Rhode Island, our smallest state, has done it again!

Sincerely yours,

LOUIS H. BAUER, M.D.

Secretary-Treasurer

#### A DOCTOR IN THE HOUSE

With the opening of the January 1953 Session of the Rhode Island General Assembly the name of Doctor William Reid was one of those listed as one of the new members of the House of Representatives. We felicitate Doctor Reid for his success at the polls last November which resulted in his election to the Assembly from the town of East Providence.

A graduate of Burrillville high school, the University of Rhode Island, and Tufts Medical School, Doctor Reid interned at Rhode Island Hospital and then served as a resident at the Lying-In Hos-

pital. During the war he served overseas with the 166th General Hospital, participating in the European Theater operations, and the Victory breakthrough to Germany. After his discharge from military duty he established his practice in obstetrics in Providence.

Public service makes many demands, but today there is imperative need that able and conscientious citizens enter political life. That Doctor Reid has accepted the challenge is to his credit. That he will discharge his duties faithfully and well for the citizens is never to be doubted. We can only hope that his action will inspire more of our physicians to enter the field of politics in the coming years.

#### THE INTERIM MEETING

The Interim Meeting took place this year in the middle of the interim, which is a very proper time for it. Unfortunately many of the places well equipped to handle such parties have to close before the fall season is open. September is really not the time for an interim meeting.

There was a large attendance. The members like the Ledgemont Country Club, which does this sort of thing beautifully. There may be a certain amount of doubt as to whether it is the mental pabulum which brings so many out, but that is all to the good. There is no doubt that social gatherings, and especially good food and drink, are valuable in keeping up the feeling of good fellowship which ought to be an important part of the profession.

Having the ladies with us helps out to the nth degree. It does seem as though doctors married especially attractive women. Unfortunately we did not get in to the meeting of the Woman's Auxiliary.

The descriptions of it sounded ravishing. Lovely ladies lavishly gowned and loaded with jewels would undoubtedly have been a treat to our male members. But at that very time duty called us to our scientific meeting.

Dr. Beeson came on from New Haven to talk to us on the "Theory of Infections." Needless to say this had mostly to do with the use of antibiotics. It was a clean-cut, instructive demonstration of the properties of many of these new drugs and their relationships, how they work together and how they sometimes seem to antagonize each other.

Dr. Reginald Smithwick's talk on the "Physiological Effects of Operations for Duodenal Ulcer" was a well-documented, well-charted discussion of the surgical treatment, with the final conclusion that a moderate partial resection of the stomach combined with vagotomy seemed to be producing, in his clinic, most excellent results.

Dr. Bauer, the President of the American Medical Association, was introduced at this meeting, but contented himself with giving us greetings at that time, as after the reception and dinner he talked on the World Medical Association of which he is Secretary-Treasurer of the United States Committee.

Dr. Bauer pointed out that many people confuse the World Medical Association with the World Health Organization. This latter is a part of the UN, and is evidently largely in the hands of the professional social workers. It is no secret that these people are firm believers in the powers of government to handle medical matters, while at present it would seem that the medical profession, in this country at least, are at the present time opposed to bureaucratic medicine.



Dr. Louis H. Bauer, center, President of the American Medical Association, with Dr. Earl F. Kelly, left, presidentelect of the Rhode Island Medical Society, and Dr. Albert H. Jackvony, president, at the Interim Meeting of the Society at the Ledgemont Country Club on December 10, 1952. Providence Journal Photo

#### AIR POLLUTION AND CANCER OF THE LUNG

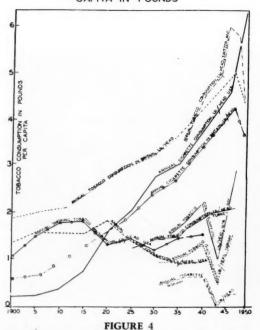
continued from page 30

nevertheless is an observation which is noteworthy because 3,4-benzpyrene seems to be one of the common carcinogenic combustion products of carbonaceous matter of many kinds.

In view of these negative findings for carcinogenic hydrocarbons in tobacco tar, some investigators recently have favored the concept that the alleged carcinogenic effect of tobacco smoke upon the respiratory tract depends at least in part upon the inhalation of arsenic present in the tobacco as an insecticide residue and volatilized during the smoking process (Doll and Hill; Goulden, Kennaway and Urquhart). In fact, rather appreciable amounts of arsenic can be demonstrated in tobacco and in tobacco smoke, especially of the American variety. Gross and Nelson found that the arsenic content of cigarette tobacco of five (5) brands ranged from 9.7 to 36.3 p.p.m., that of cigars from 8.3 to 48.4 p.p.m. and that of pipe tobacco from 26.0 to 50.0 p.p.m. Thomas and Collier noted that the range of the arsenic content of cigarette tobacco was from 35.4 to 114 p.p.m., while that of cigars was 13.2 to 29.5 and that of pipe tobacco 22.7 to 42.8 p.p.m.

Turkish tobaccos, on the other hand, have a low arsenic content ranging from 0 to 4.1 micrograms per cigarette against 25 to 55 micrograms for American cigarettes.

#### TOBACCO CONSUMPTION PER CAPITA IN POUNDS



If national consumptions of tobacco products of various types and by both sexes (fig. 4), their respective arsenic contents determined by their country of origin, and the national incidence of lung cancer during the past two to three decades are related and compared, it appears that there exist so many inconsistencies in the correlations present that a major carcinogenic role of arsenical contaminants of tobacco remains unproven if not unlikely.

Distinctly disconcerting in this respect is also the obvious disagreement of different investigators as to the relative role which cigarette smoking, on the one hand, and the smoking of pipe tobacco and cigars, on the other hand, allegedly play in the causation and rise of lung cancer. While Levin et al. contended that only cigarette smoking but not pipe and cigar smoking reveals a positive statistical correlation, Mills et al. emphasized that all three forms of smoking are equally guilty, while Wynder and Graham; Gsell; and to some degree also, Doll and Hill, assess the individual smoking habit by including all types of smoking. While Doll and Hill contemplated the possibility that pipe smoking may be less lung cancer inducive than cigarette smoking because in their opinion pipe smokers smoke less tobacco than cigarette smokers, it may be well to consider the fact that many cigarette smokers discard their cigarettes after a few puffs and that, therefore, the assessment of the degree of cigarette smoking may more easily become exaggerated while that of the pipe and cigar smoker may become underestimated. Gage indeed stated that one study strongly indicated that the average cigarette smoker consumes less tobacco per day or year than a cigar smoker or chewer.

Of undoubted importance seems to be another statement of Doll and Hill in which they note that inhaling of cigarette smoke did not convey any increased lung cancer liability. This is an observation which cannot be reconciled with facts established for determining occupational cancer incidence. Whenever the intensity and duration of exposure to an occupational carcinogen increases there rises the cancer incidence rate among the exposed population group. There is no plausible reason to assume that the inhalation of allegedly carcinogenic tobacco smoke would be exempted from this rule. The complete lack or only minor increase of laryngeal cancer during the past five decades, although the larynx forms a part of the smoke tract, also militates against the tobacco smoking theory of lung cancer.

It may be concluded that the existing evidence neither proves nor strongly indicates that tobacco smoking and especially cigarette smoking represent a major or even predominating causal factor in the production of cancers of the respiratory tract and are the main reason for the phenomenal increase of

continued on page 36

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SEARLE RESEARCH IN THE SERVICE OF MEDICINE

#### RHODE ISLAND MEDICAL JOURNAL

AIR POLLUTION AND CANCER OF THE LUNG continued from page 34

pulmonary tumors during recent decades. If excessive smoking actually plays a role in the production of lung cancer, it seems to be a minor one, if judged from the evidence on hand.

The third major type of carcinogenic air pollution is represented by exposure to carcinogenic dusts, fumes, mists, vapors, and gases sustained during specific occupational operations and to specific chemical and physical agents. As a rule well circumscribed, while with some agents rather large population groups are involved. The various respiratory carcinogens giving rise to cancers of the nasal cavity, paranasal sinuses, larynx and lungs are listed in the following table (table 9). While the number of respiratory cancers which have been attributed to contact with these agents is relatively small, there is good reason to believe that the actual number of occupational respiratory cancers produced by an occupational exposure with them is considerably larger. The respiratory tract is after all anatomically an inverted part of the skin and, therefore, comes in contact with most of those agents which elicit occupational cancers of the skin. Indeed, if the general experience as to the causation of cancer of the skin by environmental agents should be applicable with equal force to cancers of the respiratory tract, one may justly assume that the great majority of these cancers are probably of exogenous origin and caused by agents which are inhaled. It should be mentioned, however, that experimental evidence suggests that carcinogenic material entering the organism by other than the respiratory route may also produce cancers of the lung.

Since cancers of the lung in all probability shall remain for some time diseases with a predominantly fatal outcome, the future control of this rapidly

Cutaneous Cancer in Relation to Occupation graph showing the number of cases of cutaneous carcinoma in males a females in england, wales a scotland notified annually from 1911—1949 inclusive.

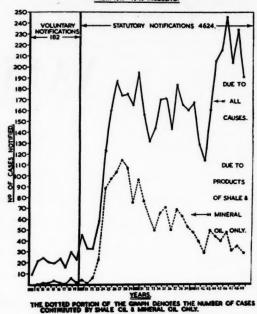


FIGURE 5
Henry, S. A., Annals of the Royal College of Surgeons of England, vol. 7, pp. 425-454 (December) 1950.

increasing health hazard must depend upon a better appreciation of the known and suspected continued on page 52

TABLE 9
Occupational Respiratory Carcinogens

Agents	Sites		ate Number led Cancers	Incidence Rate Effectively	% All Cancer
	Cancer	Total	U.S.A.	Exposed	Deaths
Aromatic Hydrocarbons					
Coal Tar Fumes	Lung	35	0		45%
Lubricating Oils	Lung	18	0		
Carbon and Silicon Polymers					
Isopropyl Oil	Paranasal Sinus				
	Larynx	12	12	100/1000	
	Lung				
Asbestosis	Lung	60	10	150/1000	
Metals					
Arsenicals	Lung	22	1		32%
Chromates	Lung	125	60		60%
Nickel	Lung				
	Nasal Cavity				
	Paranasal Sinus	127	0	?	. ?
Ionizing Radiation					
Radioactive Substances	Lung	650	0	500-800/1000	

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Pneumococcal, viral, and other pneumonias due to sensitive organism respond promptly to therapy with well-tolerated Te

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#### AMA DELEGATE'S REPORT

#### INTERIM MEETING OF THE AMERICAN MEDICAL ASSOCIATION

At Denver, Colorado, December 1-5, 1952

CHARLES L. FARRELL, M.D., Delegate

#### VETERANS' MEDICAL CARE

For many years the chief bone of contention in the House of Delegates of the A.M.A. was the controversial Veterans Administration treatment of non-service connected disabilities. The Tennessee Delegation, headed by H. H. Shoulders, M.D., a Past President of the A.M.A., has repeatedly tried to have the House agree to the principle that Blue Shield or Blue Cross Insurance, or similar types of coverage should be purchased by the government for veterans with non-service connected disabilities. Each time these proponents have been defeated in their aims. As a result of all this agitation, the American Medical Association appointed a committee which, after many months of effort, produced a 156-page volume covering all phases of Veterans' Medical Care. This is a highly informative study and is available for the inspection of any member of the Society at the Medical Library. It gives a complete analysis of the usage of the Veterans' Administration Hospital Care Program and ends with an excellent summary and conclusion.

The American Medical Association Committee definitely went on record as stating that all veterans with service connected disabilities are entitled to all the care they need at any time but that if the veteran had non-service connected disability, he was entitled to care at federal government expense only if unable to pay for treatment of tuberculosis, neuropsychiatric and other chronic conditions not readily treated at the local level. The A.M.A. Committee summed up their report by stating that non-service connected disabilities other than neuropsychiatric and tuberculosis, are the responsibility of the individual and the community, not the federal government. Even the mental and the tuberculosis cases which are non-service connected are the responsibility of the local communities rather than Federal because the federal government cannot continue indefinitely to provide treatment for all such cases.

Because the Administration's Department of Medicine and Surgery is undergoing a reorganization based in part by the recommendations obtained in the Booz, Alen and Hamilton, management survey of the Agency, the A.M.A. deferred definitive action on the controversial issue of non-service

connected cases and decided to merely go on record as to their proper disposition with the way open for further study after consultation with Veterans Administration and a survey of the Booz, Alen and Hamilton report, which had just been issued. There was no time for a thorough appraisal of this report prior to A.M.A. meeting.

The A.M.A. finally went on record as favoring new Congressional legislation which limits benefits to "service connected" cases and to non-service connected cases only for neuropsychiatric and T.B. cases who are unable to pay for treatment. It also suggests that Congress study and determine whether a provision for medical care and hospital benefits for dependents of service personnel is proper and desirable emolument of military service. The A.M.A. also endorsed the existing system of transferring seriously disabled military personnel from service hospitals to V.A. facilities.

#### AMERICAN LEGION ATTITUDE

The American Legion representatives of the A.M.A. were very active and the Vice Chairman of the American Legion Rehabilitative Commission who was also an A.M.A. Delegate from Indianapolis, made a stirring speech in which he promised to act to prevent "chiseling" at federal expense on the part of non-service connected cases. The American Legion promised full cooperation in cleaning up this situation.

#### DEPARTMENT OF HEALTH

The A.M.A. approved the development of a Federal Department of Health in the Eisenhower Cabinet but the head of this department need not necessarily be a physician. This is a change from a previous stand taken by the A.M.A.

#### I. L. O.

The A.M.A., after much debate on the floor, recommended outright withdrawal of the United States from the I.L.O. The Reference Committee recommended against outright withdrawal but the debate on the floor overruled the Reference Committee and the A.M.A. is on record as favoring the United States withdrawal at once from the I.L.O.

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#### AMA DELEGATE'S REPORT concluded from page 38 DOCTOR DRAFT

Service pay for physicians and dentists was approved for further extension. The A.M.A. voted to ask Congress to extend the law due to expire June 3, 1953 which grants \$100.00 extra pay each month for physicians and dentists. Such additional pay would be denied those physicians and dentists starting Service after July 1st, unless this law was extended.

The A.M.A. urged support of legislation that may be required to insure a supply of physicians for the care of the military personnel if physical standards are modified so that doctors with minor defects are called to duty and if greater use of civilian personnel is made in hospitals for the care of the military personnel and their dependents. It is also suggested that military services practice conservation of their medical manpower. The Armed Forces were also advised that they could do a better job of recruiting for the regular Medical Corps and that the incentives and advantages of the life in the Army be pointed up as well as a frank appraisal of the disadvantages. It also suggested the call-up of priority III physicians be held up until all I and II's have been processed for induction.

The A.M.A. House of Delegates did not intend to give any endorsement to the new doctor draft law by which physicians in service would be assigned to the care of dependents. The Army, Navy and Air Officers at present will not promise, outside of a ruling of Congress, to defer any officer from dependent care duty.

#### OSTEOPATHS

The American Medical Association has made no attempt to contact osteopaths and considers that it is up to the Osteopathic Association to make the first move in discussing cooperative teaching of osteopathic students.

APPROVED INTERNSHIP PROGRAM The House of Delegates approved the revision of

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the "Essentials of Approved Internship", a copy of which will be published in full in the JOURNAL within a few weeks.

Your Delegate also attended a meeting of the Executive Committee on the "Conferences of Presidents" which formulated plans for the June session and which will undoubtedly prove to be of the same calibre as the splendid sessions held in the past on the occasion of the meetings of "Conferences of Presidents."

Your Delegate was also appointed a member of a Special Committee of "The Council on Medical Service" to meet with the Blue Shield Commission in a study of the extension of medical care plans.

The next Annual Meeting of the American Medical Association will be held in June, 1st to 5th, at the Waldorf-Astoria, New York and it would be a very splendid idea for as many as possible to take advantage of attending the A.M.A. session this June. New York City is readily accessible; it offers a diversion of entertainment, and the A.M.A. Convention is a wonderful thing to visit. It will undoubtedly come as a surprise to many who do not realize the excellent calibre of the scientific exhibits, the section papers, and the commercial displays. Above all, it is important that physicians interested in advancement of medicine attend one of the sessions of the House of Delegates. It is quite possible to attend A.M.A. House of Delegates and to attend and speak before a Reference Committee on any subject on the Agenda. Prior to June your Delegate will list the possibilities of such action in the RIMS JOURNAL.

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Annual Meeting
R. I. Medical Society

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\*Crawley, G. A.: Clinical Study of Trocinate, A New Antispasmodic Drug, M. Rec. & Ann. 43:1104, 1949.



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#### DISTRICT MEDICAL SOCIETY MEETINGS

#### PROVIDENCE MEDICAL ASSOCIATION

A meeting of the Providence Medical Association was held at the Medical Library on Monday, December 1, 1952. The meeting was called to order by the President, Frederic J. Burns, M.D., at 8:30 p.m.

The reading of the minutes of the previous meeting was omitted.

The Secretary reported invitations to the membership to attend the meeting of the Rhode Island Regional Committee for Trauma to be held at the U. S. Naval Hospital at Newport on December 3 and to a meeting to be held at the Veterans Administration Hospital in Providence on December 4.

The Secretary reported that the Executive Committee had adopted the following resolution for presentation to the House of Delegates of the Rhode Island Medical Society:

WHEREAS the House of Delegates of the Rhode Island Medical Society alone has the authority to determine the policies of the Society, and

WHEREAS the retiring President of the Society, the Editor of the Rhode Island Medical Journal, the Delegate and the Alternate Delegate to the House of Delegates of the American Medical Association, the Director of Health of Rhode Island, and the President of the Rhode Island Medical Society Physicians Service, are not members of the House of Delegates unless elected by the component district medical society of which they are members.

THEREFORE, Be It Resolved that the Providence Medical Association recommend to the House of Delegates that an amendment to the By-Laws of the Rhode Island Medical Society be drafted to provide membership in the House of Delegates for the physicians holding the aforesaid offices, and that such amendment be submitted to the membership at the next general meeting of the Society.

The Secretary reported that the Executive Committee had submitted to the membership a slate of officers and delegates to serve the Association in 1953. The slate of nominees was read.

The President announced that the committee of Drs. Alex M. Burgess, Sr., and Peter P. Chase

had submitted the Association's tribute to the late Dr. Theodore C. Hascall for permanent file in the

The President announced that Dr. Francis Moore, Surgeon-in-Chief of the Peter Bent Brigham Hospital, will address the Annual Meeting of the Association to be held January 5.

The President introduced as the first speaker of the evening Mr. William Connell, Chief of the Division of Temporary Disability of the Department of Employment Security of Rhode Island, who spoke on "Medical Phases of the State Temporary Disability Compensation Program".

Mr. Connell discussed the organization of the State Disability Compensation Program and the role of the Physician in this tremendous program. His talk was well received.

The second speaker of the evening was Lt. Henry S. Kelly, USA, Administrative Officer, and Officer in Charge of Special Registrants of the Selective Service in Rhode Island, who discussed "Drafting of Doctors Under the Universal Military Training and Service Act".

Lt. Kelly outlined the general plan of the doctor draft in Rhode Island. He defined the various priority groups and the number of physicians in the various groups. He defined the groups as follows:

Priority group I—Physicians who participated in ASTP or V12 program and who served less than ninety days.

Priority group II—Physicians who participated in ASTP or V12 and who served 21 months or less in the Armed Forces.

Priority group III—Physicians with no training or ASTP or V12. Men without service.

Priority group IV—Physicians who served 21 months or more in the Armed Forces.

He stated that physicians 51 years of age or over will not be eligible for military service.

Only one year of internship will be permitted under the present laws pertaining to the doctor draft; after that they will be eligible for induction.

Attendance was 78.

The meeting adjourned at 10:45 p.m.

Collation was served.

Respectfully submitted,

MICHAEL DIMAIO, M.D., Secretary continued on page 44

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### DISTRICT MEDICAL SOCIETY MEETINGS concluded from page 42

#### NEWPORT COUNTY MEDICAL SOCIETY

The dinner meeting of the Newport County Medical Society was called to order by President Norbert Zielinski on November 26, 1952 at 8:30 p.m. at the Hotel Viking, with 22 members attending.

Minutes of the September meeting were read and approved.

Communications: Marquette-Alger County Medical Society certified Charles A. Serbst, M.D., as a member in good standing for 1952.

Mr. John Farrell, Exec. See'y, R. I. Medical Society, reported the result of investigation of quack medicine "adrenalin cream" as distributed in Jamestown, i.e., no St. Louis advertising media will accept advertising of either the company or the products.

Committee Reports: The secretary reported on accomplishments of Diabetes Detection Drive and thanked members for their cooperation.

Dr. Carey, delegate, reported that R. I. Physicians Service would not pay R. I. Hospital the physician's fee for ward, clinic patients who carried Physicians Service.

He also recommended that locally all doctors be listed on the Emergency Medical Program. Dr. Logler described the coverage plan as put out by the Caduceus Club in Pawtucket. After a heated discussion, it was decided that the Emergency Program would be carried out on a voluntary basis.

Dr. Adelson, councillor, stated that the course held for physician's assistants was well attended and worthwhile.

New Business: Dr. Gailitis, Dr. Gobeille and Dr. Serbst were voted into active membership.

Dr. Ramos moved that the Society recognize the validity of the R. I. Chapter of Arthritis and Rheumatism and pointed out how it would benefit the arthritis clinic at the Newport Hospital.

The speaker of the evening was Dr. William Freeman, pathologist of the Newport Hospital, who spoke on, "Recent Advances in the Use of Whole Blood and Blood Substitutes".

Dr. Freeman pointed out that in 1949 about 36 whole blood transfusions were given in the hospital

#### IN MILITARY SERVICE

LT. (J.G.) ARTHUR B. KERN, (MC) USNR, United States Naval Hospital, National Naval Medical Center, Bethesda, Maryland

LT. A. LLOYD LAGERQUIST, (MC), USNR, 901 Thirty-third Street, Richmond, California that year. This was the first year that the Newport Hospital Blood Bank was in operation. This year, 1952, the hospital has averaged more than 80 whole blood transfusions per month, so that we will use more than 1,000 pints of whole blood before the end of the year. To obtain this amount of usable whole blood, it requires more than 1300 blood donors.

He then presented a review of the specific indications and the contraindications for the use of whole blood, plasma, red cell transfusions, and albumin.

He pointed out the value of plasma to increase blood volume and osmotic pressure and its definite use in severe burns prior to red cell transfusions when the burned patient becomes anemic. During World War II, virus hepatitis was a definite complication of the use of plasma, in that 5 to 10% of the recipients came down with this disease. Now that the plasma is irradiated, the incidence of virus hepatitis is down to 1% or less, but he pointed out that virus hepatitis is even a complication of whole blood transfusions, because the donor may be in the stage of the disease when the virus is in the blood and the donor is not yet sick with the disease.

The polyvinal Pyrrlodone or PVP was used by the Germans in World War II as a synthetic plasma expander 1,000 to 1,500 cc is sufficient for the average adult to maintain the osmotic pressure of the blood.

One of the most recent discoveries is the manufacture of albumin from blood plasma from a single blood donor. Here the blood is collected in an ion-exchange column and the plasma precipitated by barium sulfate, so that the resulting supernatant clear fluid is almost pure albumin. This is feasible in the ordinary hospital laboratory that has a sterile room for plasma extractions. This chemically pure albumin has an osmotic pressure ten times greater than that of plasma. It has all the advantages with none of its complications and in addition it can be stored at room temperature for years.

An interesting question and answer period followed.

The meeting was adjourned at 10:30 p.m.

Respectfully submitted,

EDWARD ZAMIL, M.D., Secretary

#### BRISTOL COUNTY MEDICAL ASSOCIATION

At the Annual Meeting of the Bristol County Medical Association the following officers were elected for the 1952-1953 term:

President: C. Paul Bruno, M.D.

Vice President: Robert W. Drew, M.D.

Treasurer: Luther R. Lewis, M.D.

Secretary: O. John Squillante, M.D. Councillor: Charles E. Millard, M.D.

Delegate: Ralph J. Petrucci, M.D.